Electron Beam Lithography and Plasma Etching To Fabricate Supports for Studying Nanomaterials

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***Abstract*—The fabrication processes of different nano- structures by electron beam lithography (EBL) and plasma dry etching are shown. The periodic circle and square patterns with different sizes were defined in the resist by EBL and then formed in the substrates by plasma etching. The holes were created with a diameter ranging from 1um to 5um and an etch depth from around 500nm to 1um. The quality and the size of fabricated patterns and their dependence on the etching time were investigated using top-down and cross-sectional scanning electron microscopy (SEM). It was found that the structures are well-resolved in the patterns with high levels of quality and good size uniformity. The results show that the depth of the structures does not depend on their size or geometry but rather on the etch time.**

***Keywords:* EBL,plasma etching,nano-structures.**